

SOME USEFUL ENERGY FACTS

ENERGY USE

Energy consumption is expected to increase 60 percent worldwide by 2020. The largest increases are projected for the countries of developing Asia-
U.S. Department of Energy

While the United States represents 5 percent of the world's population we consume more than 26 percent of the energy produced -*American Almanac*

Missouri resident's spend about 11 percent of their personal incomes on energy needs. Some lower-income families spend as much as half their incomes on energy needs -*Missouri Environmental Improvement and Energy Resources Authority*

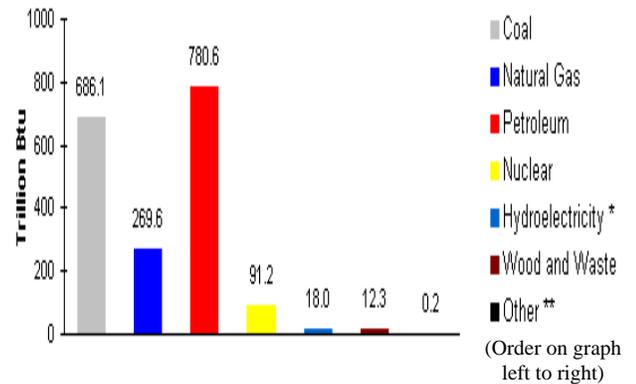
Fossil fuels provide 93.4 percent of the energy needs of Missouri-*U.S. Department of Energy*

"If every U.S. household looked for the Energy Star label on the next light bulb they purchased, the nation could save up to \$800 million annually in energy bills, keep 1 trillion pounds of global warming gases out of the atmosphere and gain air pollution reductions equivalent to removing 1.2 million cars from American roads every year."
-*C. Whitman, U.S. Environmental Protection Agency*

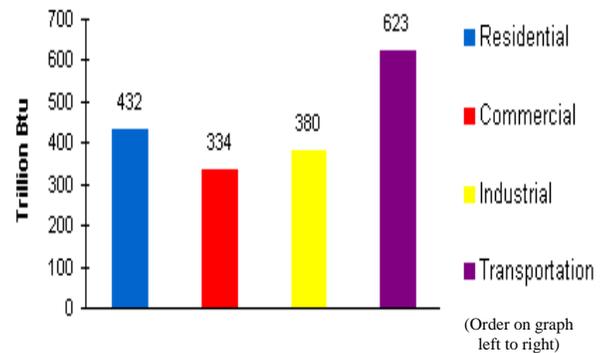
U.S. residents spent more money per year generating hot water than in meeting air-conditioning needs -*Energy Information Administration*

The two largest applications of energy by residential buildings are space heating (36 percent) and water heating (14 percent) -*Energy Information Administration*

PRIMARY ENERGY CONSUMED IN MISSOURI
U.S. DEPARTMENT OF ENERGY



ENERGY APPLICATIONS IN MISSOURI
U.S. DEPARTMENT OF ENERGY



Energy is often measured in Btu's. This stands for British thermal unit and is the amount of energy required to raise one pound of water, one degree Fahrenheit. This is the equivalent to the energy released when a single wooden match is burned.

Approximately 336,000 Missourians, roughly 15 percent of the population, live in premanufactured homes. Such buildings tend to be significantly less energy efficient than other forms of housing. A typical manufactured home can use as much as 54 percent of its energy for space heating needs - *Missouri Environmental Improvement and Energy Resources Authority*

Of the energy consumed by commercial buildings (businesses and shops) 22 percent is used for space heating and 18 percent for air-conditioning. Lighting needs compose 22 percent of the energy consumed by commercial buildings - *Energy Information Administration*

The average American uses 12,133 kilowatt-hours each year. This value is nine times higher than the amount consumed by the rest of the world's population - *Grist Magazine*

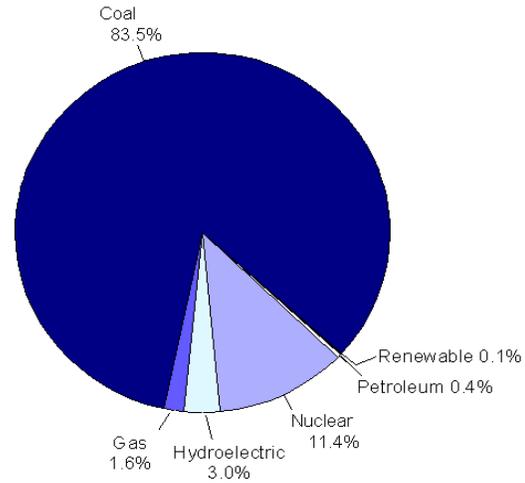
Approximately 2 billion people on earth do not have access to electrical power - *U.S. Department of energy*

The United States has more than twice the per capita energy consumption than Japan, United Kingdom, West Germany or Denmark - *Organization for Economic Cooperation and Development*

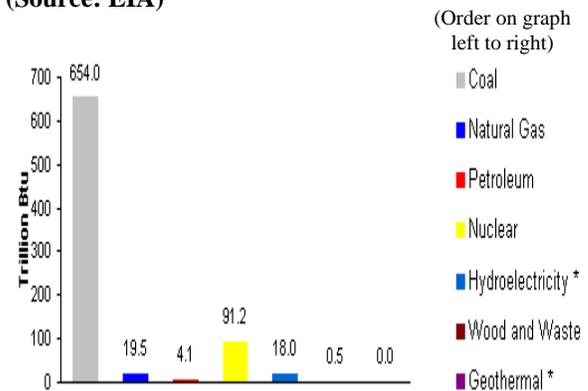
Replacing one incandescent lightbulb with an energy-saving compact fluorescent bulb can reduce carbon emissions by 1,000 pounds and saves \$67 over the life of the bulb (typically 8-10 years) - *U.S. Environmental Protection Agency*

Residential and Commercial buildings consume 36 percent of the energy used by the United States. For commercial buildings 70 percent of the energy is used in the form of electrical power - *U.S. Department of Energy*

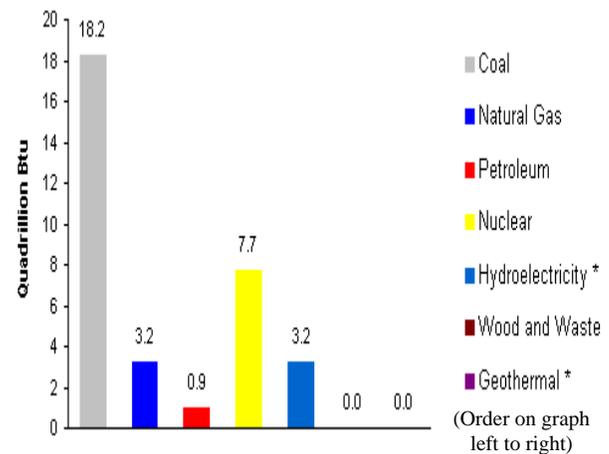
ELECTRICITY PRODUCED IN MISSOURI BY SOURCE-U.S. DEPARTMENT OF ENERGY



PRIMARY SOURCES FOR ELECTRICAL POWER PRODUCTION-MISSOURI (Source: EIA)



PRIMARY SOURCES FOR ELECTRICAL POWER PRODUCTION-UNITED STATES (Source: EIA)



NONRENEWABLE ENERGY SOURCES FACTS

Nine out of every 10 tons of coal mined in the United States is used to generate electricity - *Energy Information Administration*

Generating electricity from coal is not very efficient (<35 percent) with most of the energy being lost as heat or during electrical transmission - *Energy Information Administration*

Missouri spends more than \$635 million importing coal to the state - *Energy Information Administration*.

Only 12 other states in the U.S. use more coal than Missouri - *U.S. Department of Energy*.

Missouri generates 83.5 percent of its electrical needs using coal while the average for the rest of the United States is 54 percent. Worldwide coal is used for 55 percent of the electricity generated - *Energy Information Administration*.

In Missouri coal-fired power plants emitted 70 million tons of carbon dioxide in 1999 - *U.S. Department of Energy*

The United States consumes 2 million tons of coal per day (equivalent to 20 pounds per person every day) - *Union of Concerned Scientists*

Coal is actively mined in 27 states with the leading states being Wyoming, Kentucky, West Virginia, Pennsylvania and Texas - *U.S. Department of Energy*

Missouri has significant deposits of coal, but the high sulfur content of Missouri coal prevents its current use as an energy source.

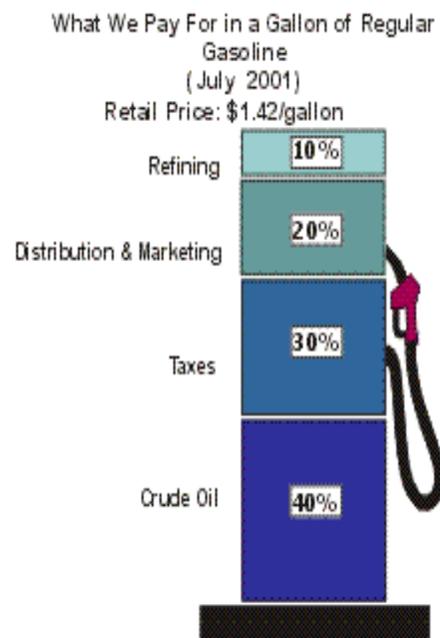
Petroleum products (such as gasoline, diesel fuel and jet fuel) are used to meet 95 percent of the United States transportation needs - *U.S. Department of Energy*

NONRENEWABLE ENERGY SOURCES:

Energy sources based on limited reserves created several million years ago by unique geological and physical conditions. Such reserves will eventually run out as the available deposits are depleted.

Examples:

- Petroleum
- Coal
- Natural gas



Source: U.S. Department of Energy

The United States consumes 17 million barrels of oil a day. More than half of this petroleum is imported. Each Missourian consumes the equivalent of 36 barrels of oil per year - *U.S. Department of Energy*.

Missouri citizens drive a total of 57 billion miles every year - *Missouri Environmental Improvement and Energy Resources Authority*

Over half of the money Missouri spends on energy is used for transportation fuels (\$6 billion/year) and all of these fuels are imported - *Energy Information Agency*

There are 160 million vehicles on the roads in the United States - *U.S. Department of Transportation*

While the world population has doubled in the last 50 years, the number of automobiles has increased tenfold. It is predicted that the number of cars will double again in the next 25 years - *Worldwatch Institute*.

Natural gas provides 22 percent of the United States energy needs - *U.S. Department of Energy*

Natural gas is the fastest growing primary source of energy and its use is projected to double by 2020 - *Energy Information Administration*

RENEWABLE ENERGY SOURCES FACTS

Only 7.5 percent of the energy used in the United States comes from renewable energy sources. Most of this amount is in the form of hydropower and biomass (wood burning) - *National Renewable Energy Lab*

Wind power is the fastest growing renewable energy source in the world - *Worldwatch Institute*

Wind power could be practically developed to provide as much as 20 percent of the United States electrical needs - *U.S. Department of Energy*

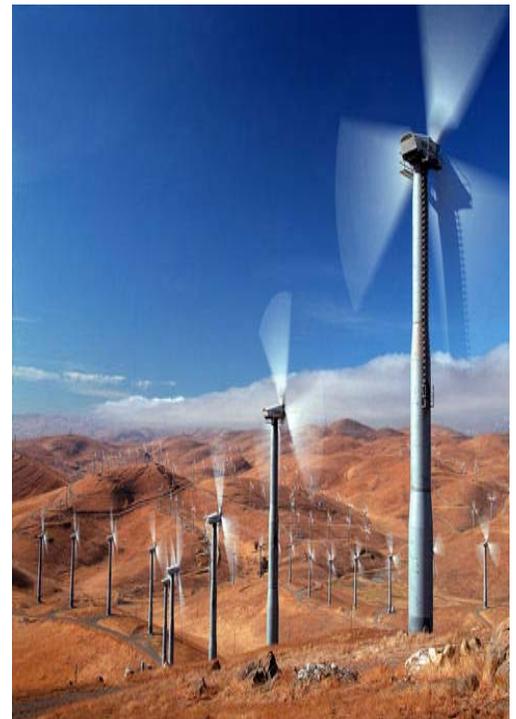
In areas with excellent wind resources, wind energy costs an average of 3 to 4 cents per kilowatt-hour and is now about the same as using coal. Wind power may well

RENEWABLE ENERGY SOURCES:

Energy sources based on natural cycles that are replenished in a relatively short time frame. These resources can be managed to meet long-term power needs and will not run out. Trees and crops can be replanted. The sun shines each day. Rivers flow to the sea and winds can be expected to continue to blow.

Examples:

- Geothermal energy
- Solar energy
- Biomass energy
- Wind energy
- Hydropower



be cheaper than coal if reductions in environmental costs are also considered - *Journal of Science*

The United States is the world's leading supplier of hydroelectric power - *Energy Information Agency*

40 percent of the electricity generated in El Salvador comes from geothermal resources - *National Renewable Energy Lab*

An estimated 28.4 billion kilowatt-hours could be generated using renewable Biomass fuels in Missouri. This is enough power to meet the needs of over 2 million homes - *U.S. Department of Energy*

The United States produces more than 1.4 billion gallons of ethanol from Biomass annually. Approximately 12 percent of the nation's gasoline is now blended with ethanol - *Missouri Corn Growers Association*

SOME ENVIRONMENTAL EFFECTS OF ENERGY USE

Americans use a billion gallons of motor oil a year with 350 million gallons of this oil ending up polluting the environment - *U.S. Department of Energy*

Approximately 81 tons of mercury are produced every year by coal-fired electric plants in the United States - *Environmental Protection Agency*

Energy processes such as motor fuels, coal-fired electric plants and the use of natural gas result in 75 percent of Missouri's air emissions - *Missouri Environmental Improvement and Energy Resources Authority*

Coal produces 80 percent more carbon dioxide than natural gas and 20 percent more carbon dioxide emissions than fuel oils - *Energy Information Administration*.

MAJOR ENVIRONMENTAL ISSUES RELATED TO ENERGY USE:

Global Climate Change. Warming of the planet as a result of so-called greenhouse gases. Global levels of carbon dioxide have increased 25 percent in the last 100 years. Fossil fuels produce large amounts of carbon dioxide during their use.

Air Pollution. Most metropolitan areas, including St. Louis and Kansas City, are facing problems with smog, ozone levels and a general degradation of air quality. The majority of air pollution issues are the result of energy applications such as automobile exhausts and power plant emissions.

Acid Deposition. "Acid Rain" has been linked to coal-fired power plant emissions and automobile exhausts. Acidic precipitation (rain and snow) causes damage to forest and aquatic ecosystems. As a result of prevailing weather patterns and local geology this problem is especially pronounced in the northeastern United States.

Land Disturbance and Water Quality

Degradation. Mine tailings and mining land disturbance have been associated with water quality problems related to toxic metals, acidification and sedimentation.

Ecosystem Disturbance. Biological systems are often adversely impacted from energy related activities. Impacts occur during mining and drilling (Example: strip mining for coal), transport (Example: Exxon oil spill), fuel use (Example: mercury emissions from coal/related fish consumption advisories) and disposal (Example: used motor oil and water quality impacts).